# METHYL TERT-BUTYL ETHER (MTBE)

Also known as: Methyl t-butyl ether, Tert-butyl methyl ether, 2-methoxy-2-methylpropane
Chemical reference number (CAS): 1634-04-4

## WHAT IS MTBE?

MTBE is a gasoline additive with a very strong odor. By adding chemicals like MTBE, engines produce less carbon monoxide and other carbon-containing air pollutants by burning this "reformulated" gasoline. In cities where air quality is a problem, reformulated gasoline may contain up to 15% MTBE.

MTBE dissolves easily in water and also evaporates quickly. If it's spilled, MTBE will evaporate quickly. However, if MTBE is spilled on soil, some of it can seep into groundwater where it can remain unchanged for many years.

When underground storage tanks leak, MTBE may be one of the first chemicals to show up in area drinking water wells. Most people can smell MTBE in contaminated water at levels as low as 100 parts per billion (ppb).

## HOW ARE PEOPLE EXPOSED TO MTBE?

**Breathing**: Exposure to MTBE can occur when people fill gas cans or automobiles with gasoline. You should avoid breathing gasoline vapors while refueling. We suggest you store gasoline in a tightly sealed container, and place the container away from your home in a locked storage shed so vapors cannot enter your home.

People can also be exposed to MTBE when they breathe engine exhaust. When drinking water is contaminated, people can inhale MTBE as they bathe or do laundry.

**Drinking/Eating**: Low level exposure can happen when contaminated water is used for drinking and/or for food preparation.

**Touching**: MTBE can be absorbed through skin when people handle gasoline, contaminated soil, or water. Skin contact is most likely to happen as people fill their tanks with gasoline. As you refuel engines, avoid spilling gasoline on your clothing or skin.

## DO STANDARDS EXIST FOR REGULATING MTBE?

**Air**: No standards exist for the amount of MTBE released by cars or allowed in the air of homes. We use a formula to convert workplace limits to suggested home limits. Based on the formula, we recommend levels of MTBE be no higher than 4 parts per million (ppm) in homes.

The Wisconsin Department of Natural Resources regulates the amount of MTBE that can be released by industries.

**Water**: The Wisconsin groundwater standard for MTBE is 60 parts per billion (ppb). We suggest you stop drinking water containing more than 60 ppb of MTBE. If levels of MTBE are very high in your water, you may need to avoid washing, bathing or using the water for other purposes. Contact your local public health agency for more information specific to your situation.

## WILL EXPOSURE TO MTBE RESULT IN HARMFUL HEALTH EFFECTS?

*Although the following symptoms are associated with MTBE, gasoline contains other ingredients that may cause similar health effects.*

Immediately or shortly after exposure to MTBE (at levels similar to when you fill your car with gasoline) people may experience irritation of the eyes, nose and throat, and headache or dizziness. Some of these symptoms may result from the bad odor of the chemical. At even higher levels (in industrial settings) people can feel drunk, have trouble breathing and lose coordination.

Currently, the effects on humans of long-term exposure to low levels of MTBE are unknown. The following are results of studies using laboratory animals:

**Organ Systems**: When fed high doses of MTBE, some laboratory animals lost weight and developed liver and kidney problems.

**Cancer**: When exposed to high levels of MTBE over a long period of time, some laboratory animals developed kidney tumors, testicular tumors, lymphoma and leukemia.

**Reproductive Effects**: It's not known whether MTBE exposure can affect fertility or pregnancy.

In general, chemicals affect the same organ systems in all people who are exposed. However, the seriousness of the effects may vary from person to person. A person's reaction depends on several things, including individual health, heredity, previous exposure to chemicals including medicines, and personal habits such as smoking or drinking.

It is also important to consider the length of exposure to the chemical; the amount of chemical exposure; and whether the chemical was inhaled, touched, or eaten.

## CAN A MEDICAL TEST DETERMINE EXPOSURE TO MTBE?

Because it leaves the body quickly, MTBE and its breakdown product, "butyl alcohol," can only be measured in exhaled breath, urine, and blood for 1-2 days after exposure. Doctors can use function tests of the nervous system, kidneys, or liver to track the long-term health of people regularly exposed to MTBE at work.

*Seek medical advice if you have any symptoms that you think may be related to chemical exposure.*

This fact sheet summarizes information about this chemical and is not a complete listing of all possible effects. It does not refer to work exposure or emergency situations.

## FOR MORE INFORMATION

- Poison Control Center, 800-815-8855
- Your local public health agency
- Division of Public Health, BEH, 1 West Wilson Street, Rm. 150, Madison, WI 53701-2659, (608) 266-1120 or Internet: http://www.dhfs.state.wi.us/eh

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